

What is claimed is:

1. A method of controlling a number of sessions established on a communication network, comprising:
  - (a) inputting at least a first data packet transmitted on the communication network;
  - (b) determining a new session corresponding to the at least the first data packet, wherein the new session is requested by at least a first user and wherein the at least the first user has an account authorizing the at least the first user to establish sessions on the communication network;
  - (c) determining if a creation of the new session would exceed a permitted usage of the communication network, wherein the permitted usage corresponds to the account;
  - (d) if the creation of the new session would exceed the permitted usage, preventing the new session from being created; and
  - (e) if the creation of the new session would not exceed the permitted usage, allowing the new session to be created.
2. The method as claimed in claim 1, wherein the at least the first user corresponds to a single user who has the account.
3. The method as claimed in claim 1, wherein the at least the first user corresponds to an organization of a plurality of users and wherein the organization has the account.
4. The method as claimed in claim 1, wherein the operation (c) comprises:

(c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the elapsed time.

5. The method as claimed in claim 1, wherein the operation (c) comprises:

(c1) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the session rate value.

6. The method as claimed in claim 1, wherein the operation (c) comprises:

(c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested; and

(c2) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to a product of the elapsed time and the session rate value.

7. The method as claimed in claim 1, wherein the operation (c) comprises:

(c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested;

(c2) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions; and

(c3) determining an AvailableTokens value, wherein the AvailableTokens value is directly related to a product of the elapsed time and the session rate value and is directly related to a probability that the creation of the new session would not exceed the permitted usage.

8. The method as claimed in claim 7, wherein the operation (c) further comprises:

(c4) determining if the AvailableTokens value is greater than an nTokens value, wherein an nTokens value is a value relating to a cost of establishing the new session;

(c5) if the AvailableTokens value is greater than the nTokens value, determining that the creation of the new session would not exceed the permitted usage; and

(c6) if the AvailableTokens value is less than the nTokens value, determining that the creation of the new session would exceed the permitted usage.

9. The method as claimed in claim 7, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

10. The method as claimed in claim 8, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

11. The method as claimed in claim 7, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.

12. The method as claimed in claim 8, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.

13. The method as claimed in claim 9, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein

the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

14. The method as claimed in claim 10, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

15. The method as claimed in claim 10, wherein the operation (c5) further comprises:

(c5a) if the AvailableTokens value is greater than the nTokens value, setting the AvailableTokens value equal to a new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

16. The method as claimed in claim 14, wherein the operation (c5) further comprises:

(c5a) if the AvailableTokens value is greater than the nTokens value, setting the AvailableTokens value equals to a new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

17. The method as claimed in claim 8, wherein the nTokens value is the same for all types of sessions that can potentially be established on the communication network.

18. The method as claimed in claim 8, wherein the nTokens value corresponds to an amount of bandwidth required to establish the new session.

19. The method as claimed in claim 8, wherein the nTokens value corresponds to a lifetime of the new session.

20. The method as claimed in claim 8, wherein the nTokens value corresponds to an amount of system resources required by the new session.

21. The method as claimed in claim 8, wherein the nTokens value corresponds to an importance of the new session.

22. A software program contained on a computer readable medium for controlling a number of sessions established on a communication network, wherein the software program includes instructions to instruct a controller to perform a routine comprising:

- 2025 RELEASE UNDER E.O. 14176
- (a) inputting at least a first data packet transmitted on the communication network;
  - (b) determining a new session corresponding to the at least the first data packet, wherein the new session is requested by at least a first user and wherein the at least the first user has an account authorizing the at least the first user to establish sessions on the communication network;
  - (c) determining if a creation of the new session would exceed a permitted usage of the communication network, wherein the permitted usage corresponds to the account;
  - (d) if the creation of the new session would exceed the permitted usage, preventing the new session from being created; and
  - (e) if the creation of the new session would not exceed the permitted usage, allowing the new session to be created.

23. The software program as claimed in claim 22, wherein the at least the first user corresponds to a single user who has the account.

24. The software program as claimed in claim 22, wherein the at least the first user corresponds to an organization of a plurality of users and wherein the organization has the account.

25. The software program as claimed in claim 22, wherein the operation (c) comprises:

- (c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the elapsed time.

26. The software program as claimed in claim 22, wherein the operation (c) comprises:

(c1) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the session rate value.

27. The software program as claimed in claim 22, wherein the operation (c) comprises:

(c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested; and

(c2) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to a product of the elapsed time and the session rate value.

28. The software program as claimed in claim 22, wherein the operation (c) comprises:

(c1) determining an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested;



(c2) determining a session rate value that corresponds to a rate at which the account is authorized to create sessions; and

(c3) determining an AvailableTokens value, wherein the AvailableTokens value is directly related to a product of the elapsed time and the session rate value and is directly related to a probability that the creation of the new session would not exceed the permitted usage.

29. The software program as claimed in claim 28, wherein the operation (c) further comprises:

(c4) determining if the AvailableTokens value is greater than an nTokens value, wherein an nTokens value is a value relating to a cost of establishing the new session;

(c5) if the AvailableTokens value is greater than the nTokens value, determining that the creation of the new session would not exceed the permitted usage; and

(c6) if the AvailableTokens value is less than the nTokens value, determining that the creation of the new session would exceed the permitted usage.

30. The software program as claimed in claim 28, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and

wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

31. The software program as claimed in claim 29, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and

wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

32. The software program as claimed in claim 28, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.

33. The software program as claimed in claim 29, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.

34. The software program as claimed in claim 30, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

35. The software program as claimed in claim 31, wherein the operation (c3) comprises:

(c3a) determining an AvailableTokens value;

(c3b) if the AvailableTokens value is greater than a committed burst size value, having the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions; and

(c3c) if the AvailableTokens value is less than the committed burst size value, having the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

36. The software program as claimed in claim 31, wherein the operation (c5) further comprises:

(c5a) if the AvailableTokens value is greater than the nTokens value, setting the AvailableTokens value equal to a new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

37. The software program as claimed in claim 35, wherein the operation (c5) further comprises:

(c5a) if the AvailableTokens value is greater than the nTokens value, setting the AvailableTokens value equals to a new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

38. The software program as claimed in claim 29, wherein the nTokens value is the same for all types of sessions that can potentially be established on the communication network.

39. The software program as claimed in claim 29, wherein the nTokens value corresponds to an amount of bandwidth required to establish the new session.

40. The software program as claimed in claim 29, wherein the nTokens value corresponds to a lifetime of the new session.

41. The software program as claimed in claim 29, wherein the nTokens value corresponds to an amount of system resources required by the new session.

42. The software program as claimed in claim 29, wherein the nTokens value corresponds to an importance of the new session.

43. A system for controlling a number of sessions established on a communication network, comprising:

an interface that inputs at least a first data packet transmitted on the communication network; and

a controller that receives the at least the first data packet, wherein the controller determines a new session corresponding to the at least the first data packet,

wherein the new session is requested by at least a first user and wherein the at least the first user has an account, which is at least indirectly set up with the controller and which authorizes the at least the first user to establish sessions on the communication network,

wherein the controller determines if a creation of the new session would exceed a permitted usage of the communication network, wherein the permitted usage corresponds to the account,

wherein, if the creation of the new session would exceed the permitted usage, the controller prevents the new session from being created, and

wherein, if the creation of the new session would not exceed the permitted usage, the controller allows the new session to be created.

44. The system as claimed in claim 43, wherein the at least the first user corresponds to a single user who has the account.

45. The system as claimed in claim 43, wherein the at least the first user corresponds to an organization of a plurality of users and wherein the organization has the account,

46. The system as claimed in claim 43, wherein the controller determines an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the elapsed time.

47. The system as claimed in claim 43, wherein the controller determines a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to the session rate value.

48. The system as claimed in claim 43, wherein the controller determines an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested, and

wherein the controller determines a session rate value that corresponds to a rate at which the account is authorized to create sessions,

wherein a probability that the creation of the new session would not exceed the permitted usage is directly related to a product of the elapsed time and the session rate value.

49. The system as claimed in claim 43, wherein the controller determines an elapsed time from when a previous session corresponding to the account is requested and when the new session is requested,

wherein the controller determines a session rate value that corresponds to a rate at which the account is authorized to create sessions, and

wherein the controller determines an AvailableTokens value, wherein the AvailableTokens value is directly related to a product of the elapsed time and the session rate value and is directly related to a probability that the creation of the new session would not exceed the permitted usage.

50. The system as claimed in claim 49, wherein the controller determines if the AvailableTokens value is greater than an nTokens value, wherein an nTokens value is a value relating to a cost of establishing the new session,

wherein, if the AvailableTokens value is greater than the nTokens value, the controller determines that the creation of the new session would not exceed the permitted usage, and

wherein, if the AvailableTokens value is less than the nTokens value, the controller determines that the creation of the new session would exceed the permitted usage.

51. The system as claimed in claim 49, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and

wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

52. The system as claimed in claim 50, wherein an AddTokens value is directly related to a product of the elapsed time and the session rate value, and

wherein the AvailableTokens value is directly related to a sum of at least the AddTokens value and a previous value of the AvailableTokens value.

53. The system as claimed in claim 49, wherein the controller determines an AvailableTokens value,

wherein, if the AvailableTokens value is greater than a committed burst size value, the controller has the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions, and

wherein, if the AvailableTokens value is less than the committed burst size value, the controller has the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.

54. The system as claimed in claim 50, wherein the controller determines an AvailableTokens value;

wherein, if the AvailableTokens value is greater than a committed burst size value, the controller has the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions, and

wherein, if the AvailableTokens value is less than the committed burst size value, the controller has the AvailableTokens value be directly related to the product of the elapsed time and the session rate value.



55. The system as claimed in claim 51, wherein the controller determines an AvailableTokens value;

wherein, if the AvailableTokens value is greater than a committed burst size value, the controller has the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions, and

wherein, if the AvailableTokens value is less than the committed burst size value, the controller has the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

56. The system as claimed in claim 52, wherein the controller determines an AvailableTokens value;

wherein, if the AvailableTokens value is greater than a committed burst size value, the controller has the AvailableTokens value correspond to the committed burst size value, wherein the committed burst size value corresponds to a maximum number of sessions permitted by a node of the communication network during a burst of new sessions, and

wherein, if the AvailableTokens value is less than the committed burst size value, the controller has the AvailableTokens value correspond to the sum of at least the AddTokens value and the previous value of the AvailableTokens value.

57. The system as claimed in claim 52, wherein, if the AvailableTokens value is greater than the nTokens value, the controller sets the AvailableTokens value equal to a

new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

58. The system as claimed in claim 56, wherein, if the AvailableTokens value is greater than the nTokens value, the controller sets the AvailableTokens value equal to a new value corresponding to a difference between an existing value of the AvailableTokens value and the nTokens value.

59. The system as claimed in claim 50, wherein the nTokens value is the same for all types of sessions that can potentially be established on the communication network.

60. The system as claimed in claim 50, wherein the nTokens value corresponds to an amount of bandwidth required establishing the new session.

61. The system as claimed in claim 50, wherein the nTokens value corresponds to a lifetime of the new session.

62. The system as claimed in claim 50, wherein the nTokens value corresponds to an amount of system resources required by the new session.

63. The system as claimed in claim 50, wherein the nTokens value corresponds to an importance of the new session.